GEOTECHNICAL FORENSIC INVESTIGATION REPORT 430 EAST 77TH STREET NEW YORK, NEW YORK

ALEA NORTH AMERICA INSURANCE
c/o
ROBINSON & COLE LLP
885 Third Avenue
New York, NY 10022

Mueser Rutledge Consulting Engineers
14 Penn Plaza - 225 West 34th Street
New York, NY 10122

June 16, 2005

Mueser Rutledge
Consulting Engineers
14 Penn Plaza • 225 W. 34th Street • New York, NY 10122
Tel: (917) 339-9300 • Fax: (917) 339-9400
www.mrce.com

June 16, 2005

Alea North America Insurance
c/o
Robinson & Cole LLP
885 Third Avenue
New York, NY 10022

Attention: Mr. Michael B. Golden

Re: Geotechnical Forensic Investigation Report
430 East 77th Street
New York, New York
MRCE File No. 10414
Claim # 057-430-050202

Gentlemen,

In accordance with our proposal dated April 20, 2005, Mueser Rutledge Consulting Engineers (MRCE) has completed a forensic investigation for the above referenced project. We summarize herein the results of the investigation and our interpretation of subsurface conditions encountered and the causes of the settlements experienced by the subject property.

EXHIBITS

The following exhibits are attached to illustrate our Report.

Exhibit	Description
Figure No. 1	Site Location Plan
Appendix A	MRCE Test Pit Logs – TP1 & TP2
Appendix B	MRCE Photos

PROJECT DESCRIPTION

430 East 77th Street is a 7-story residential building located on East 77th Street between 1st Avenue and York Avenue on the Upper East Side of Manhattan (Figure No. 1). The building has a frontage of approximately 50 feet and is about 66 feet deep. The ground floor is approximately 4 feet below sidewalk elevation. The westerly adjoining property

is a 6-story residential brick building. The easterly adjoining property is an active parking garage owned and operated by STA Parking Corporation (the garage) occupying the full block depth in a north-south direction from East 77th Street to East 76th Street. The garage is currently undergoing expansions to their facilities that include adding an additional below-grade floor to their structure as well as adding several levels above.

During excavations and underpinning operations at the garage, the southeast corner of 430 East 77th Street settled approximately 3 inches, causing severe damage to the building. The damage is evidenced by severe cracking of the exterior brick façade, interior wall tiles, masonry units, floors, walls, and ceilings. The damage is illustrated by photographs in Appendix B. Damage to the interiors of the apartment units is most severe on the ground floor apartments and less severe on the upper floors. However, damage to the interiors were observed in all apartments on the eastern side of the building (F and E units) up to and including the top floor. Damage to the exterior façade is most severe on the southern wall, specifically the southeast corner of the building. The eastern line of windows on the south wall are all "racked", individual bricks are sloped to the east with some bricks experiencing vertical cracking, and in many areas mortar between bricks has been cracked and is missing.

Evidence of differential settlement is observed along the easterly wall from the southeast corner northwards for approximately 45 feet. It is at this point where the underpinning activity has been halted by order of the NYC DOB.

MRCE has been retained to investigate the causes of the settlement of 430 East 77th Street and make recommendations on how to halt any further settlement. We understand that the western foundation wall of the garage was underpinned by conventional underpinning piers. Reportedly, the eastern foundation wall of 430 East 77th Street was also underpinned in the same manner up to a point approximately 24 feet south of the north property line.

AVAILABLE INFORMATION

MRCE has been provided with:

1. Logs of borings completed for STA Parking Garage, 1991.
2. Drawing No S-1, 433 E 76th St. / 434 East 77th Street, Structural and Underpinning, 4-1-2005, Richard J. Zaloum, PE.

The engineer of record for the garage, Richard J. Zaloum, PE, verbally provided the following information:

1. Underpinning piers were provided for the eastern foundation wall of 430 East 77th Street.
2. The underpinning piers for 430 East 77th Street were poured separately from the underpinning piers for the garage, with a bond breaker installed between the 2 underpinning piers.
3. All underpinning piers were installed on decomposed rock (NYC Class 4-65) or better.
4. Steel wedges and plates were used to transfer load from the building to the underpinning piers.

5. The office of Richard J. Zaloum, PE provided controlled inspection of the underpinning operations at the garage.

A site visit to the garage revealed that some underpinning piers were excavated up to a 6 foot width. The Structural and Underpinning drawing prepared for the garage calls for a maximum width of 4 foot, which is standard and customary. Also, minimal drypacking between the underpinning piers and the foundation were observed and in some cases, no drypacking was observed. No steel wedges and plates were visible along the top of the underpinning piers and drypack interface.

EXPLORATORY TEST PITS

Two exploratory test pits, TP1 and TP2, were excavated within the ground floor apartments of 430 East 77th Street. The test pits were excavated to expose the bottom of the foundation in order to determine the condition of the underpinning piers installed by the garage. The test pits were excavated between May 17, 2005 and June 7, 2005 by Coffey Contracting, Inc. of Queens, NY.

TP1, in the northeast apartment (Unit LF) was located approximately 36 feet south of the north property line and measured 4.5 ft x 3.5 ft in plan and had a final depth of 14.5 feet below the top of the 1st floor slab (about 18 feet below sidewalk elevation). TP2, in the southeast apartment (Unit LE) was located approximately 60 feet south of north property line. TP2 had a plan dimension of 5 ft x 2.5 ft and a final depth of about 15 feet below the top of the 1st floor slab (about 19 feet below sidewalk elevation). Sketches and photographs of the test pits are included as Appendices A and B.

Both test pits revealed that underpinning was not provided to support the foundation of 430 East 77th Street during excavations to deepen the foundations of the garage. Both test pits were then deepened to expose the bottom of the underpinning piers installed for the garage to determine the bearing material for the underpinning piers. Steel probes were driven several feet below the underpinning level and did not indicate the presence of the decomposed rock strata.

Upon completion of the exploratory test pits, underpinning piers were installed in each test pit. Concrete with a minimum 28-day compressive strength of 4,000 psi was placed from the bottom of the excavation (bottom of the underpinning piers for the garage) to within 3 inches of the bottom of the foundation for 430 East 77th Street. After the concrete was allowed to cure for 3 days, steel plates and 2 pairs of steel wedges were installed in each pier. Drypack (dry, grout mix) was installed between the top plate and the bottom of the foundation and also in all voids between the top of the underpinning pier and the bottom of the foundation. The dry pack was compacted using short pieces of timber and a hammer. The steel wedges were driven together using a sledge hammer to transfer load from the building foundation into the underpinning piers.

After installing the underpinning piers in the test pit locations, the test pits were backfilled with the excavated material up to a depth of 5 feet below the top of the 1st floor slab. The remainder was backfilled with recycled concrete and masonry material having a maximum dimension of ¾ inch. All backfill was placed in lifts and compacted between lifts. Recycled material was used to backfill because the excavated soil is predominantly a silty-clay material and will experience long-term consolidation under its own weight which will cause cracking of the floor slab.

FINDINGS

Test Pit TP1

TP1 revealed that the foundation of 430 East 77th Street is constructed of cemented boulders extending to a depth of about 5.5 feet on top of un-cemented, large, irregularly-sized boulders. The bottom of the foundation wall is about 8.5 feet below the top of the 1st floor slab. The soil below the foundation is classified as a stiff silty-clay (NYC Class 9-65).

The underpinning piers installed below the foundation of the garage was exposed in test pit TP1. No form work for the underpinning piers was encountered. The concrete of the underpinning piers was found to be setback approximately 25 inches east of the face of the foundation wall on the south end of the test pit. On the north end of the test pit, the concrete of the underpinning piers was found to be setback approximately 14 inches from the face of the foundation wall (see Test Pit sketched included in Appendix A). A semi-vertical groove was observed in the concrete of the underpinning piers, indicating a possible joint between 2 underpinning piers. It appears that the excavation below the foundation for the garage was advanced without providing support of excavation. Once the excavation under the foundation of the garage reached the desired depth, formwork was placed on the garage side for the underpinning pier and concrete was placed in direct contact with the soil on the west face of the underpinning piers. The bottom of the underpinning piers was measured to be 14.5 feet below the top of the 1st floor slab, approximately 6.5 feet below the foundation of 430 East 77th Street.

Test Pit TP2

TP2 revealed that the foundation of 430 East 77th Street is constructed of concrete. The different foundation type is due to the fact that the rear portion of the building is a later addition to the original building built circa 1960. The bottom of the foundation wall is about 7.8 feet below the top of the 1st floor slab. The soil below the foundation is classified as a stiff silty-clay (NYC Class 9-65). Evidence of soil contamination was encountered in TP2. The silty-clay soil below the bottom of the foundation was found to be contaminated with petroleum hydrocarbons. No free product was observed and the contaminated soil was measured to be approximately 18 inches in thickness. A sample of the contaminated soil was obtained and sent to Environmental Testing Laboratories, Inc. of Farmingdale, NY for testing. A test of total petroleum hydrocarbons, EPA test method 418.1, revealed the presence of hydrocarbons at a level of 319 ppm.

The underpinning piers installed below the foundation of the garage was exposed in test pit TP2. The form work for the underpinning piers was left in place and is setback from the face of the foundation wall of 430 East 77th Street by approximately 24 inches. The bottom of the underpinning piers was measured to be 14.7 feet below the top of the 1st floor slab, which is approximately 7 feet below the bottom of the foundation of 430 East 77th Street.

Probe holes were drilled through the underpinning piers into the garage at both test pit locations to verify the details of the underpinning (i.e. locations of the test pits in relation to the garage foundation, top elevation of underpinning, and thickness of concrete). The concrete of the underpinning piers at TP1 and TP2 was measure to be 21 inches and 22 inches, respectively. Field measurements show that the east wall of 430 East 77th Street is about 27 inches at the north

end of the building and 17 inches at the south end of the building. Both test pits were excavated to expose the bottom of the garage underpinning. It was found that the underpinning piers at both locations are bearing in stiff silty-clay soils, not in decomposed rock as was claimed by the engineer and called for on the structural and underpinning drawing for the garage. A steel probe was driven to a depth of 3 feet below the bottom of the underpinning pier in TP1 and 2.5 feet below the bottom of the underpinning pier in TP2 and did not encounter refusal at either location.

CONCLUSIONS

The excavations completed at the garage caused loosening of the soil beneath the foundations of the east wall of 430 East 77th Street. This loosening of the soil caused the foundation of 430 East 77th Street to settle by as much as 3 inches. The settlement of the foundation caused differential settlement of the building superstructure, which is evidenced by the damage to the various building elements.

It appears that because of the settlement of the foundation, the east wall of 430 East 77th Street has rotated at its base towards the east and is now being partially supported by the west wall of the STA Garage.

The following conclusions as to the causes of the building settlement have been determined.

1. Underpinning was not provided to support the foundation of the east wall of 430 East 77th Street, as required by the NYC Building Code and claimed by the engineer for the garage.
2. Support of excavation was not provided at all locations. This allowed the soil supporting the foundation of 430 East 77th Street to expand laterally, which in turn allowed the foundation to settle.
3. Some of the underpinning piers installed for the foundation of the garage were up to 6 foot in width. This excessive excavation width created greater loosening of the soil and an unstable condition.
4. The underpinning piers installed under the foundation of the garage is bearing in silty-clay soils, not in decomposed rock as was claimed by the engineer and called for on the structural and underpinning drawing for the garage. Any increased loading on the garage structure will induce consolidation of the silty-clay soil, in turn causing further settlement of both, the garage and the 430 East 77th Street property.

RECOMMENDATIONS

The current state of the foundations of 430 East 77th Street is unstable. The foundations appear to have settled by as much as 3 inches. The loosened soil condition created by the excavations at the garage still exists and if no action is taken, further settlement of the building can be expected. Further, it is anticipated that additional development of the garage property will occur at a future date. It is our opinion that additional loads placed on the foundations of the garage will induce settlements of the structure as their underpinning piers are bearing on the compressible silty-clay stratum. Any settlement of the garage will likely induce further settlement of 430 East 77th Street as the foundations for the 2 structures are no longer independent of each other. It is our recommendations that:

1. The east wall of 430 East 77th Street be underpinned. We recommend installing traditional underpinning piers. The depth of the piers should be limited to the depth of the underpinning piers installed for the garage so as to avoid the need of underpinning the garage foundations. The underpinning piers should have a widened base (min 4 ft) so as to distribute the building load over a wider area. The piers should have a maximum width of 4 foot and be installed in a staggered sequence to ensure that no 2 piers within 12 feet of each other are excavated simultaneously. The concrete used for the piers should have a minimum 28-day compressive strength of 4,000 psi. Drypack and a minimum of 3 pairs of steel wedges should be used in each underpinning pier.
2. Expansion of the STA Parking Garage Structure is expected to continue at a future date. It is our opinion that additional loads placed on the foundations of the garage will induce settlements of the structure, as their underpinning piers are bearing on the compressible silty-clay stratum. Consolidation of the soil beneath the foundation of 430 East 77th Street due to increased loading on the foundations of the STA Garage will cause further settlement of 430 East 77th Street. **We recommend that the STA Garage Facility not be allowed to continue with any further work to their facilities until corrective measures are taken. However, the underpinning proposed above will not protect 430 East 77th Street from experiencing further settlement if significant additional loads are added to the garage.**

Please do not hesitate to contact us if we can be of further assistance.

Very truly yours,

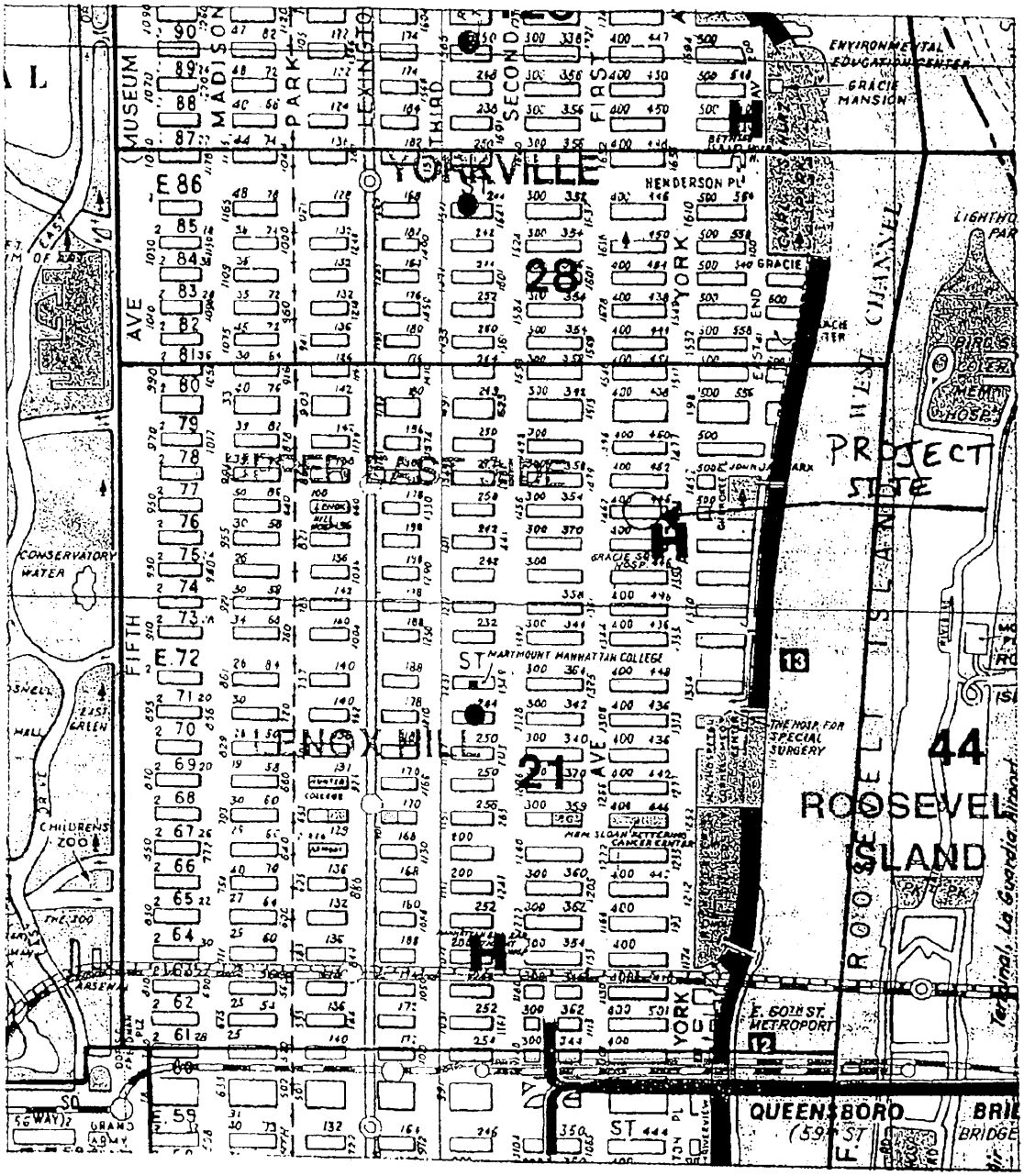
MUESER RUTLEDGE CONSULTING ENGINEERS

By: _____
Hugh S. Lacy, Partner

By: _____
Peter L. Madarasz

PLM:RKR:HSL
F:\104\10414\Report\Report.doc

EXHIBITS



NOTE: BASE PLAN OBTAINED FROM HAGSTROM NEW YORK CITY 5 BOROUGH ATLAS, 1998

430 East 77th Street NEW YORK		NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122		
SCALE N/A	MADE BY: PLM DATE: 06-13-05 CHKD BY: RKR DATE: 06-14-05	FILE No. 10414
SITE LOCATION PLAN		FIGURE 1

APPENDIX A

MUESER RUTLEDGE CONSULTING ENGINEERS File No. 10414

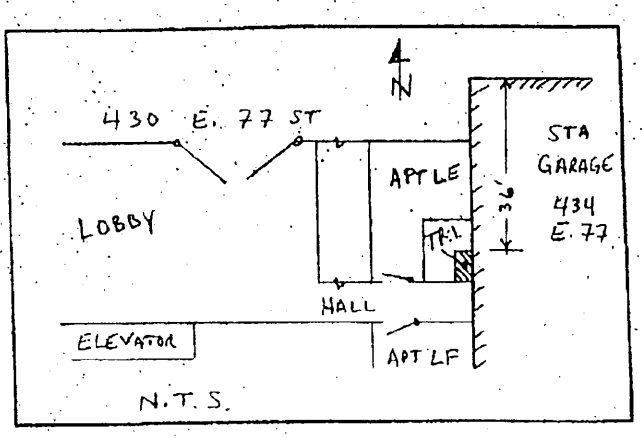
TEST PIT LOG Date 6/1/05

Project 430 EAST 77 STREET

Location BATHROOM INSIDE APT # LE (NE APT)

Test Pit No. TP 1

Res. Engr. KN/PLM



NOTES

PLAN DIMENSIONS OF PIT 4'6" (N-S) x 3'2" (E-W)

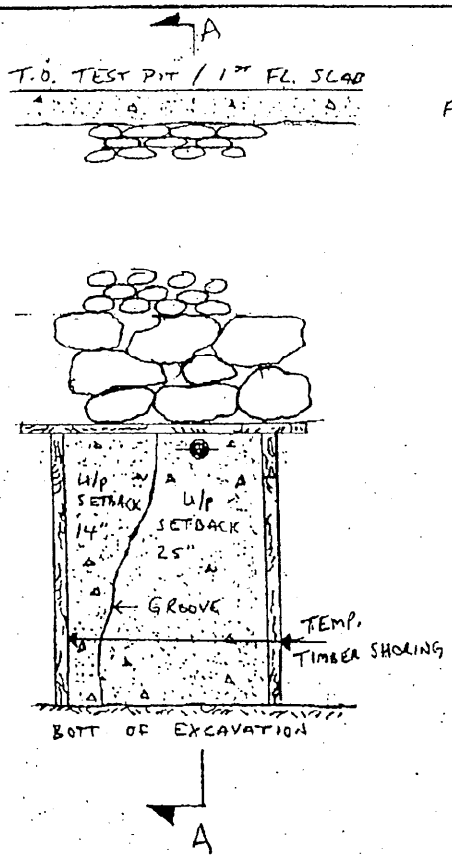
LOCATION OF PIT: ~38' FROM ℄ OF PIT TO N. PROPERTY LINE

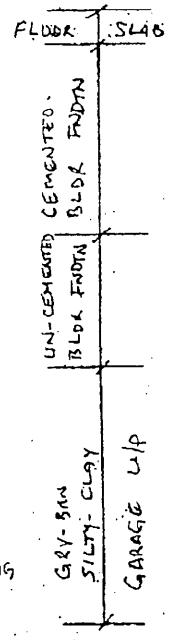
T.O. TEST PIT GRADE 3'6" ± BELOW E. 77 SIDEWALK EL (+30' ±)

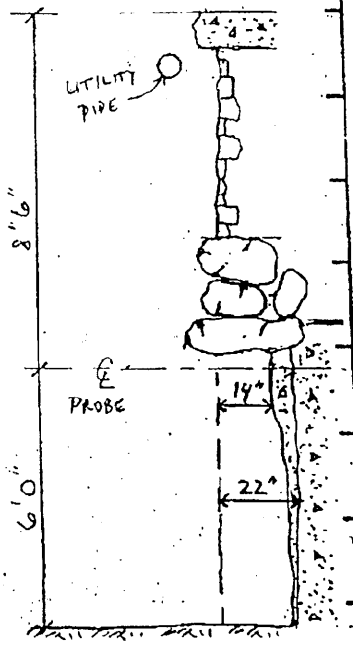
PAGE 1 OF 2

Ground Surface Elevation +26.5 ±

Sample Depth	Description	Depth
0 – 10"	T.O. TEST PIT / 1ST FL. SLAB	0
4'6"	FLOOR SLAB; UN-CEMENTED CEMENTED. BLDR FNDTN; UN-CEMENTED BLDR FNDTN	2, 4, 6
5'4"		
2'8"	GRY-BRN SILTY CLAY GARAGE U/P	8
8'0"		
6'6"		10, 12
14'6"	BOTT OF EXCAVATION	14
		16, 18, 20







SECTION A-A

(SEE PAGE 2 FOR DETAILS)

* TEMP. TIMBER SUPPORT UNDER FNDTN. NOT SHOWN FOR CLARITY

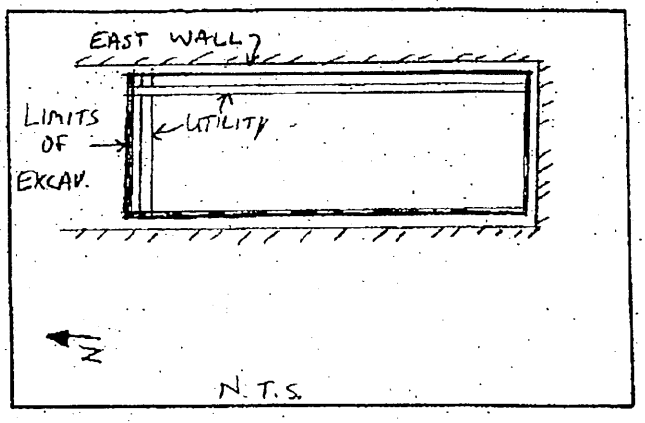
STA 0032

MUESER RUTLEDGE CONSULTING ENGINEERS File No. 10414

TEST PIT LOG Date 6/1/05

Project 430 EAST 77 ST. Test Pit No. TP 1

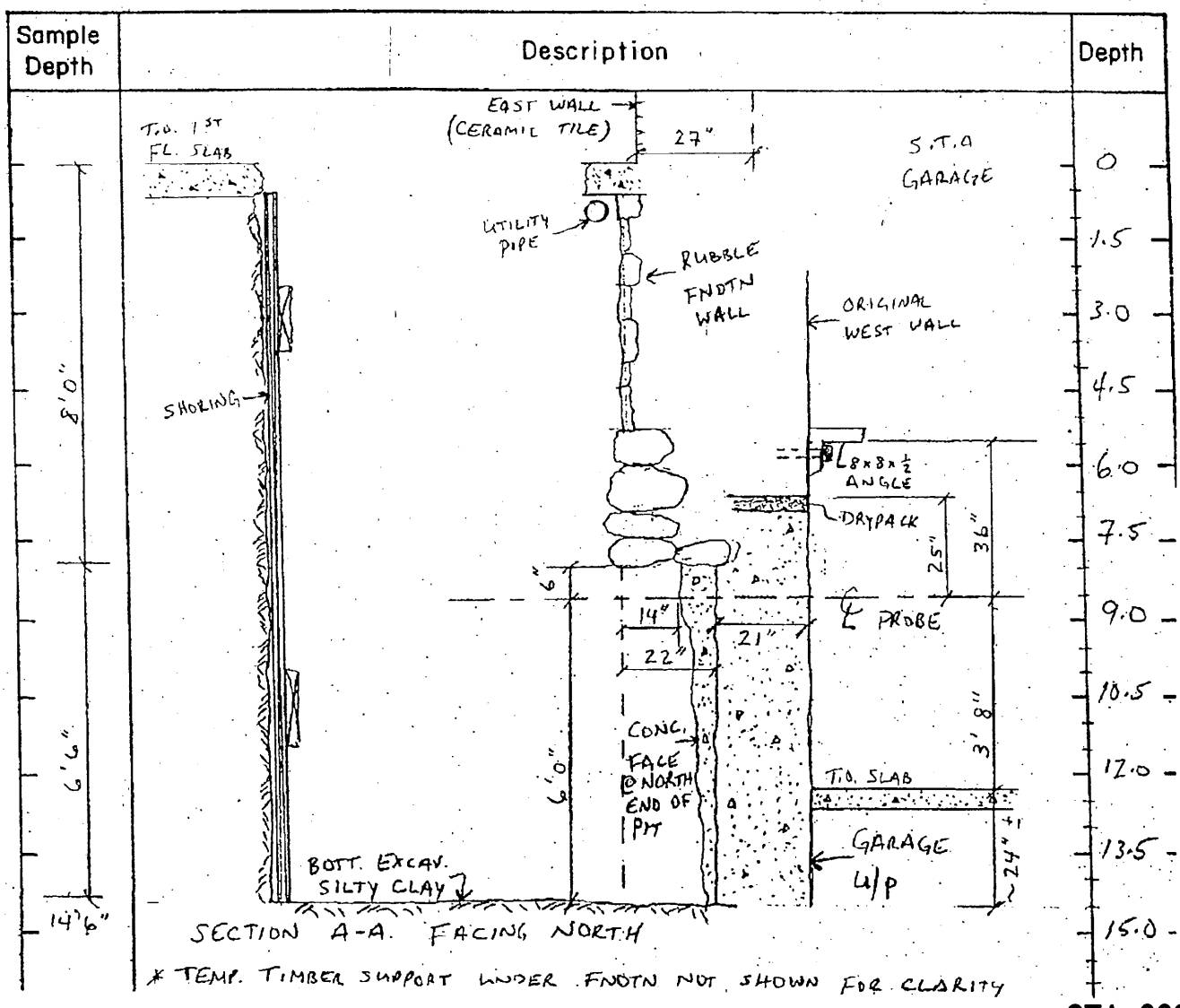
Location INSIDE APT # 1E (NE APT) Res. Engr. KN/PLM



NOTES

PAGE 2 OF 2

Ground Surface Elevation +27 ±



SECTION A-A. FACING NORTH

* TEMP. TIMBER SUPPORT UNDER FNDTN NOT SHOWN FOR CLARITY

STA 0033

MUESER RUTLEDGE CONSULTING ENGINEERS File No. 10414

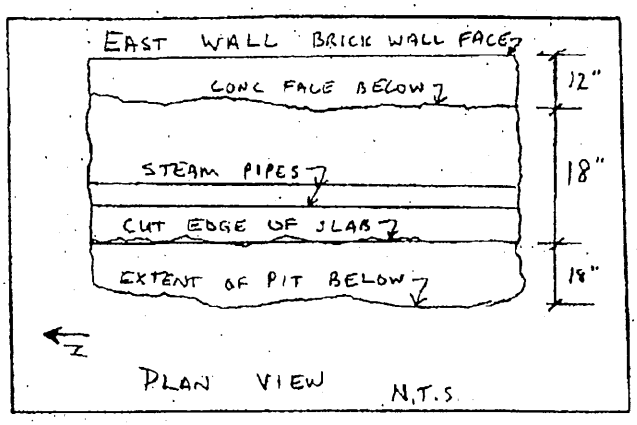
TEST PIT LOG Date 6/1/05

Project 430 EAST 77 ST.

Location INSIDE APT # LF, SE CORNER OF BLDG

Test Pit No. TP-2

Res. Engr. PLM



NOTES

PAGE 2 OF 2

Ground Surface Elevation +27 ±

Sample Depth	Description	Depth
	430 E. 77 ST. T.O. TEST PIT; EAST BRICK WALL; STEAM PIPES; 17"; 15"; S.T.A. GARAGE; ORIGINAL WEST WALL; TIMBER SHEETING; *NOT ALL SHORING SHOWN FOR CLARITY; WIDE FLANGE BEAM; 8x8x½ ANGLE; DRY PACK; BOTT OF FTG; 11"; 12"; ℄ PROBE; 25"; GARAGE SLAB; 6'3"; 3'8"; T.O. SLAB; TIMBER SHORING; 2'1"; 14'8"; BOTT OF EXCAVATION SILTY CLAY; 22"; 8'8"; 7'-9"; 6'-11"; 14'8"	0; 1.5; 3.0; 4.5; 6.0; 7.5; 8'8" 9.0; 10.5; 12.0; 13.5; 14'8" 15.0

SECTION A-A FACING NORTH

APPENDIX B

Photo 1. South wall looking North. Damaged bricks and "racking" of windows.

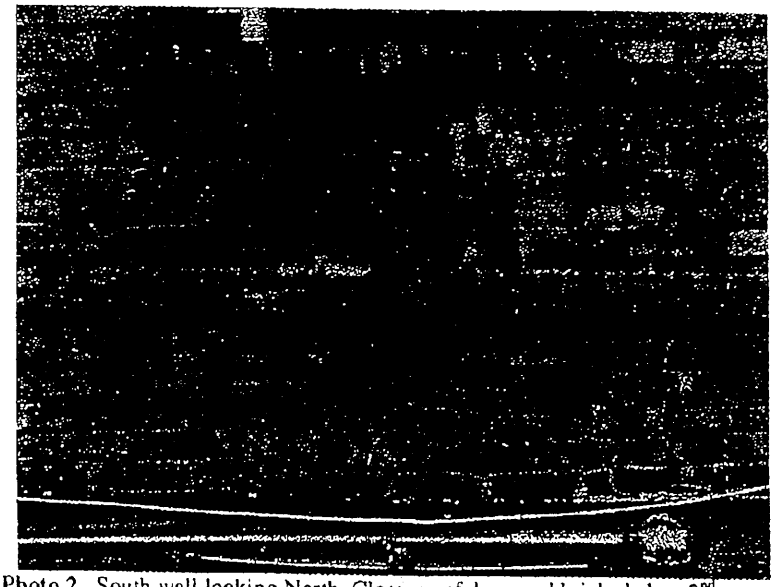


Photo 2. South wall looking North. Close-up of damaged bricks below 2nd Floor east corner window.

430 East 77th Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
GENERAL SITE CONDITIONS			PLATE 1

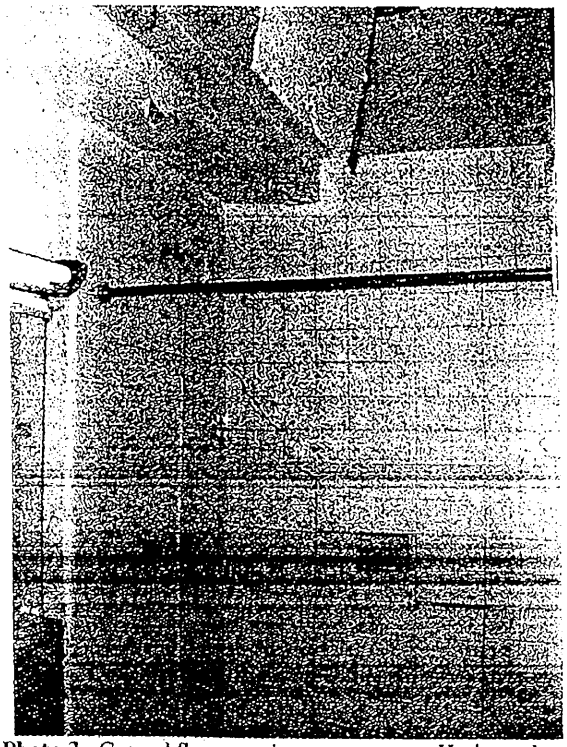


Photo 3. Ground floor, northeast apartment. Horizontal and vertical cracking of ceramic tile wall.

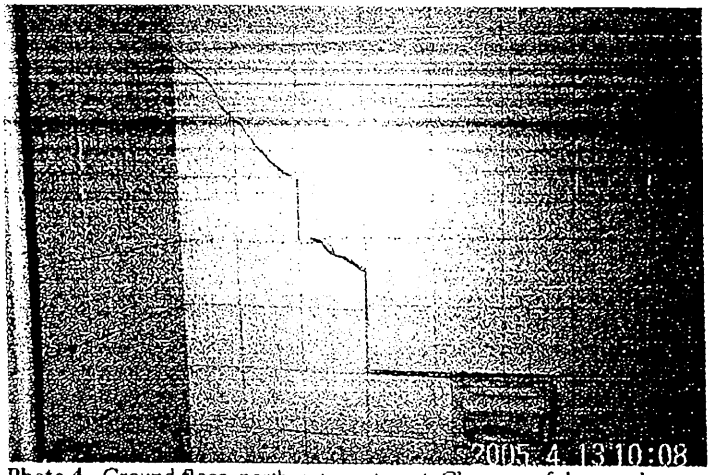


Photo 4. Ground floor, northeast apartment. Close-up of damaged ceramic tile wall.

430 East 77th Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
GENERAL SITE CONDITIONS			PLATE 2

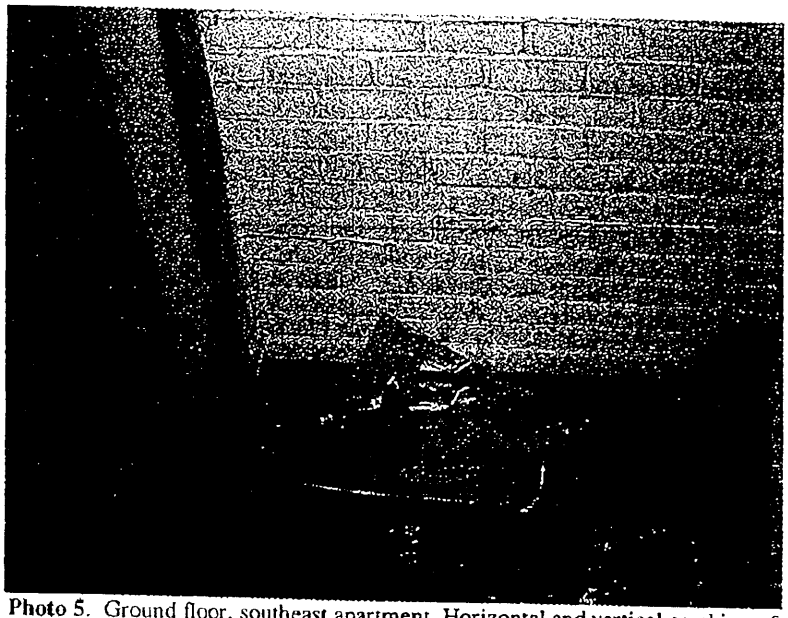


Photo 5. Ground floor, southeast apartment. Horizontal and vertical cracking of east brick wall.

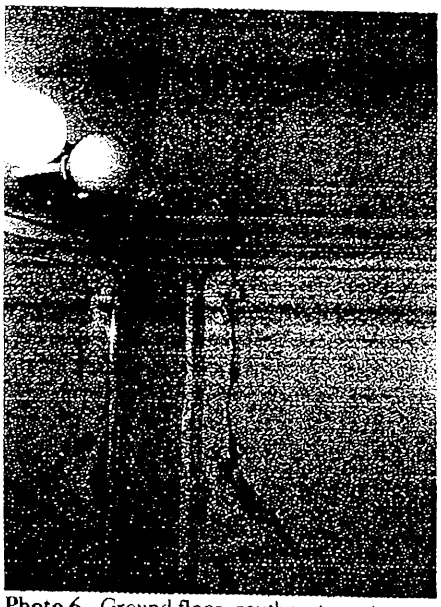


Photo 6. Ground floor, southeast apartment. Damaged sheet rock wall in bathroom.

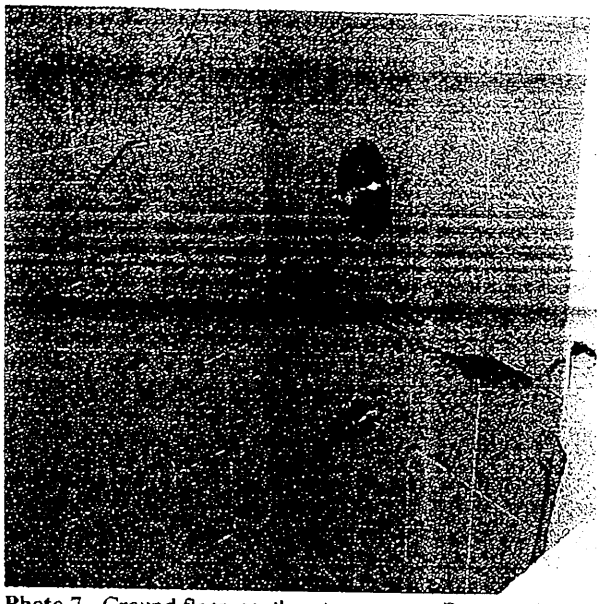


Photo 7. Ground floor, southeast apartment. Damaged ceramic tile wall in bathroom.

430 East 77th Street NEW YORK NEW YORK			
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
GENERAL SITE CONDITIONS			PLATE 3

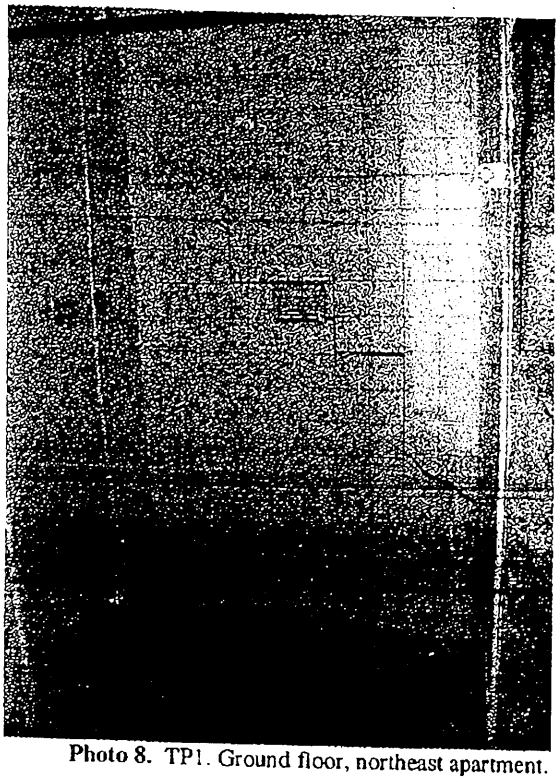


Photo 8. TP1. Ground floor, northeast apartment.

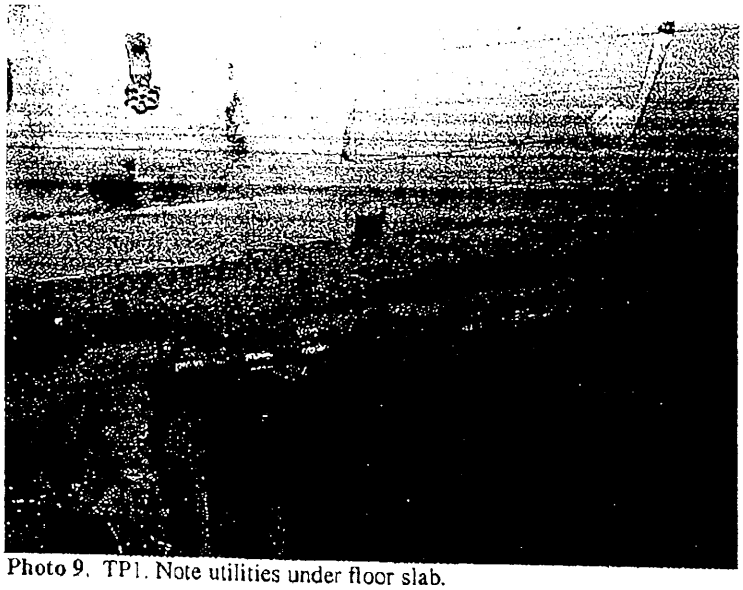


Photo 9. TP1. Note utilities under floor slab.

430 East 77th Street NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
Test Pit TP 1			PLATE 4

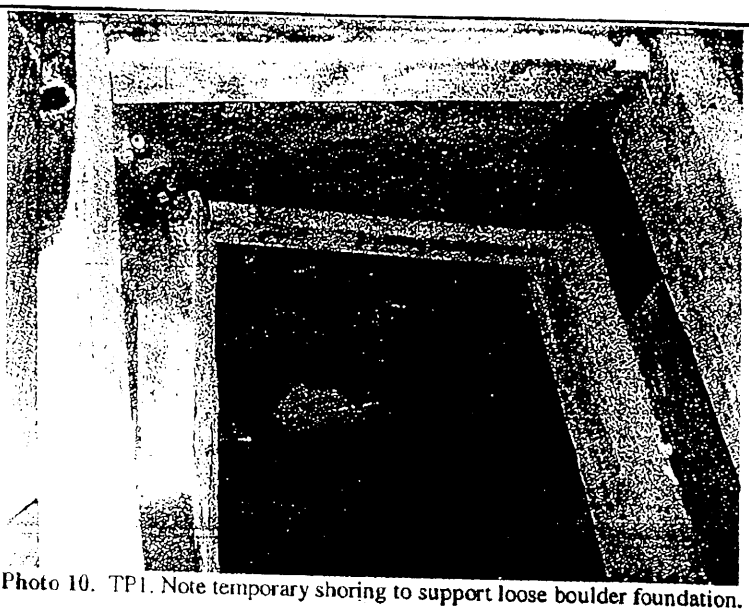


Photo 10. TP1. Note temporary shoring to support loose boulder foundation.

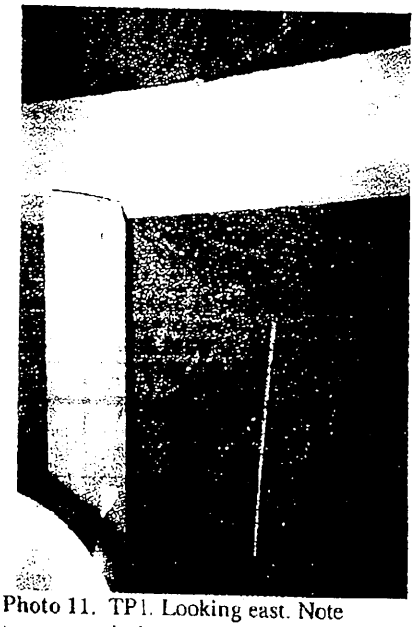


Photo 11. TP1. Looking east. Note temporary timber shoring to support loose boulder foundation. The tape measure is resting on the garage underpinning setback approximately 24 inches from face of foundation wall.

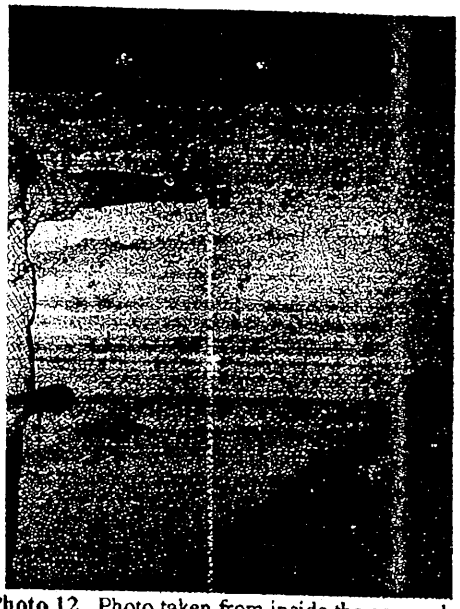


Photo 12. Photo taken from inside the garage looking west. The flashlight beam is directed on the probe hole drilled from inside TP1, which measures 44 inches from the top of the garage floor slab.

430 East 77th Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
Test Pit TP 1			PLATE 5

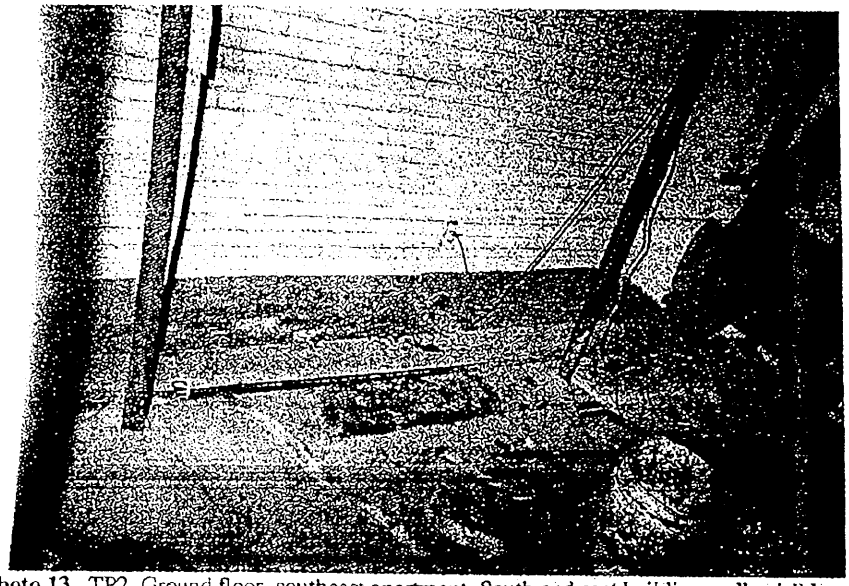


Photo 13. TP2. Ground floor, southeast apartment. South and east building walls visible.

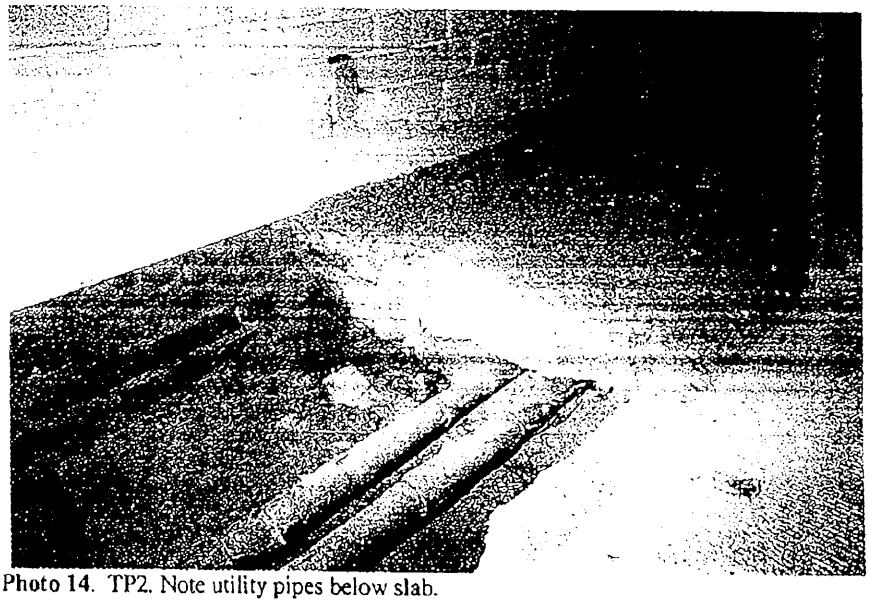


Photo 14. TP2. Note utility pipes below slab.

430 East 77th Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
Test Pit TP 2			PLATE 6

Photo 15. TP2. Bottom of east wall footing and probe hole shown.

Photo 16. TP2. Probe hole measured 12 inches below bottom of footing.

430 East 77th Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
Test Pit TP 2			PLATE 7

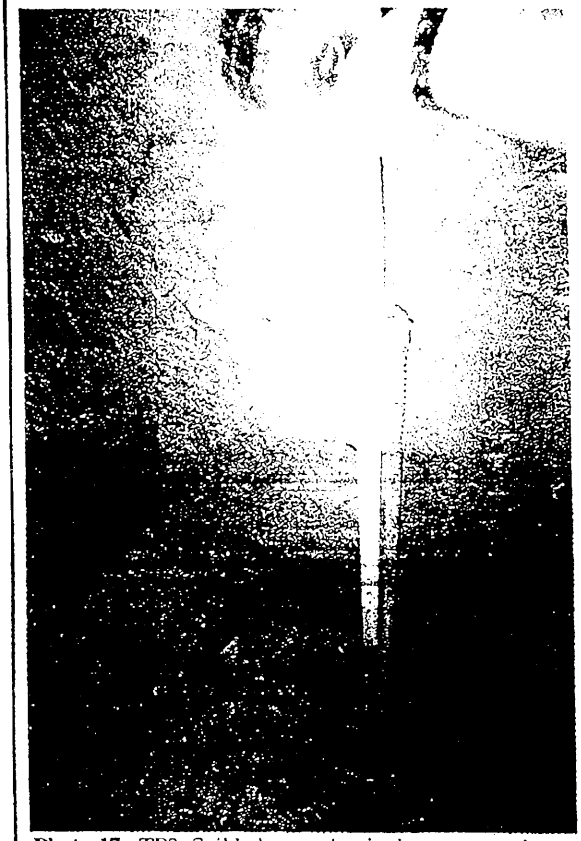


Photo 17. TP2. Soil below underpinning excavated. Steel probe driven 2.5 feet below bottom of underpinning.

Photo 18. TP2. Close-up of bottom of underpinning with steel probe.

430 East 77[th] Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34[TH] STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
Test Pit T P2			PLATE 8

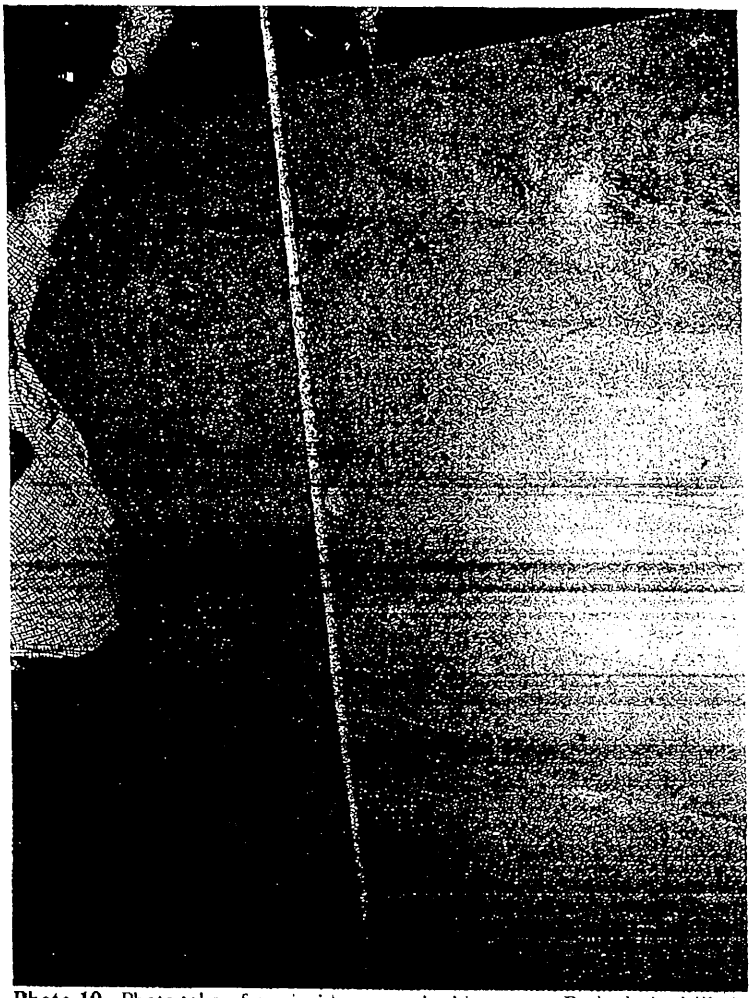


Photo 19. Photo taken from inside garage looking west. Probe hole drilled from inside TP2 shown and measured 44 inches from top of garage floor slab.

430 East 77th Street			
NEW YORK			NEW YORK
MUESER RUTLEDGE CONSULTING ENGINEERS 225 WEST 34TH STREET, NEW YORK NY 10122			
SCALE N/A	MADE BY: PLM CH'KD BY: RKR	DATE: 06-13-05 DATE: 06-14-05	FILE No. 10414
Test Pit TP 2			PLATE 9